

Web Browser based Computer Network
For Processing Vehicle Rental Transactions
On a Large Scale

Cross Reference to Related Applications

This application is a continuation-in-part of PCT serial no. _____, filed October 19, 2001, which is a continuation-in-part of serial no. 09/694,050 filed October 20, 2000, which is a
5 continuation-in-part of serial no. 09/641,820, filed August 18, 2000, the disclosures of all of which are incorporated herein by reference.

Introduction

The invention disclosed and claimed in the parent filings cross
referenced above relates generally to the field of an Internet
10 enabled business-to-business intelligent communication link allowing
a first business organization to have intelligent interaction with a
second fully integrated business organization to facilitate the
placing of orders or reservations for business services or goods,
with the services or goods provider having a computer network linking
15 multiple levels of its organization to provide for the smooth conduct
of business between the two organizations. More particularly, this
field relates to an Internet enabled automatic rental vehicle
transaction system to facilitate the conduct of rental vehicle
transactions between two multilevel business organizations, one of

which provides such rental vehicle transaction services in an integrated manner through business enterprise software to a high volume user of such rental vehicle services wherein an Internet web portal is defined by the rental vehicle service provider which interconnects the two business organizations at multiple levels, providing a graphical user interface (GUI) for the transaction of large amounts of rental vehicle services automatically and virtually without human intervention upon entry. The invention of the present continuation-in-part application extends the functionality of the parent invention by extending that paradigm of internet communication to the proprietary software program internal to the service provider. In other words, the parent invention facilitated the communication between the service provider organization to the user organization through the use of a web browser and internet connectivity. The choice of an internal "fulfillment" program resident on the service provider's computer network was independent of that invention so long as the proper protocols and interconnectivity were provided. The parent invention also provides an intelligent portal that is readily configurable to suit any particular customer and any particular provider data requirements or method of doing business. This added functionality allows the parent invention, for example, to provide the user with access to other suppliers in the same seamless and integrated manner. In other words, the user now has access to not just one integrated business but multiple businesses, some of which may but need not be, integrated businesses thereby extending the invention for use in a generic application to satisfy a user's needs for a good or service not just from one vendor but all vendors connected to the invention. By extending the internet paradigm to the fulfillment software program and computer network resident on the service provider's computer network, significant advantages are gained not only in many aspects of the business operations of the service provider itself, but there is also a synergistic effect experienced by effectively marrying these two major software programs in a common methodology.

Background of the Invention

Computer technology has been embraced by many businesses in order to handle their ever increasing order flow as well as to mitigate the increasing blizzard of paper required to be produced to document this business. A significant benefit which often drives the

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otherwise disabled vehicles were being repaired or otherwise made ready for use. The implementation of this system provided a great step forward over the people intensive business activity previously required in order to handle the large number of transactions encountered in this business relationship as between the service provider and its customers.

Historically, the replacement car market engendered large numbers of telephone calls being placed between the insurance company, the rental company, and the body shop where vehicle repair was being performed in order to authorize the rental, select and secure the desired replacement vehicle to be provided, monitor the progress of the repair work so that scheduling of the rental vehicle could be controlled, extending the vehicle rental in the event of delays in repair, authorizing various activities involved in the rental process including upgrades of vehicles or other charges for services, and subsequent billing of the rental service and processing the billing to the insurance company for payment.

While the implementation of this system was successful and represented a tremendous step forward in automating the business relationship between the insurance company and the vehicle rental company, it did have certain limitations. For example, a specific communication link had to be established between the rental vehicle company and the particular users at the insurance company designated to have access to this system. Thus, special attention and some modicum of expense was required to establish these "pipelines" and maintain them. Still another aspect to the system implemented was that it was not "browser" based nor did it provide graphical user interface (GUI) menus. Thus, each user had to be specifically trained in the particular "language" used by the system and learn to work with specific menus nested in a specific manner as well as codes for entering commands which were not similar to other computer software programs. This software design thus necessarily required additional training in order to insure that users could gain the full measure of advantage provided by the system and in order to minimize the opportunity for erroneous information or incorrect reservations from being entered or otherwise confusing the business transactions. Furthermore, user efficiency was not immediate and required skill beyond that ordinarily found in casual computer users, as we are all becoming in this computer age. Still another disadvantage to the

system was that access was required to a designated entry point in the system in order for a person authorized to be on the system to work with it. As the nature of the insurance and replacement car business requires extreme mobility at multiple levels of both business partners, this represents a limitation to the usefulness and time efficiency with which various business functions could be performed. Therefore, while implementation of the second mainframe allowing for pipeline connections at various levels of the multi-tiered insurance company was a significant step forward in automating the business relationship between the two business partners, significant limitations to this solution were readily apparent to the users thereof.

These same kind of limitations were also experienced in the "fulfillment" software program and computer network of the service provider used to execute on its customer's orders. Training issues, performance issues including under utilization due to user unfamiliarity with the program and its capabilities, and flexibility limited the effectiveness of the program although it represented the best that could be done to effectively transact the massive scope of the business enjoyed by the service provider.

Summary of the Invention

In the parent applications cross-referenced above, the inventors herein have succeeded in designing and developing a means for substantially enhancing the business to business communication link between these two businesses which provide significant advantages over its prior implementation. More particularly, the inventors have succeeded in replacing the dedicated pipeline access of the existing system with a web portal allowing Internet access to the mainframe with a browser based graphical user interface (GUI) presentation. This also made the system more readily accessible to smaller business partners as the expense of the "pipeline" was eliminated. The parent invention offers several important technical advantages over the previous system. First of all, by taking advantage of the ubiquitous nature of the Internet, the ultimate in portability and connectivity for this system is now provided in a business environment where mobility and connectivity are at a premium. In other words, a claims adjuster, body shop, or any other customer or related business employee authorized to have access to the system may gain access at any site offering Internet access. In

present day technology that includes many mobile devices and appliances which are Internet enabled. As technology advances, it is conceivable that this access will extend to permit "24/7" access by any authorized person at any geographic location. This is a marked
5 improvement providing immediate benefit and advantage over the dedicated pipeline access of the prior art system.

A second major advantage of the parent invention is its graphical user interface. The inventors have taken full advantage of this browser based GUI to streamline and organize the presentation of
10 information to a user to actually guide him as he interacts in doing his business. One such example is customized design of the menus such that the user is guided and directed to answer only those questions required to be answered in order to conduct the particular transaction being addressed, and further to present choices to the
15 user for his selection to minimize the need for the user to rely on his own memory or to be familiar with complicated and specialized codes to enter data or request transaction activity. With the recent and continuing explosion of the Internet, more people are becoming familiar with browser programs and their operation through their own
20 daily activities in their personal lives. This familiarity paves the way for easier training and quicker orientation of a new user to the present invention. For large business organizations communicating at multiple levels, this significant advantage cannot be minimized as there are large numbers of people who must be continuously trained
25 due to the growth of the organizations, as well as the replacement of employees due to the inevitable attrition. Thus, the parent invention provides an immediate increase in worker productivity, and makes that improved efficiency available to many more workers who are not particularly skilled otherwise in computer usage.

30 Still another advantage provided by the parent invention is through the implementation of additional functionalities which are engendered by the browser/GUI interface. As the system is continuously used, and feedback is continuously monitored and analyzed, additional features that add value through providing
35 management information as well as by speeding transaction activity over the system may be implemented. For example, several of these features include the ability of a user to create an on demand report for transaction activity including summaries of transactions handled by a particular user or group of users which might either be open or

closed. Another example of additional functionality which improves the efficiency of a user is the ability to create a repair facility call back list which allows a user to sort existing open vehicle rental reservations by repair facility (body shop) and date such that a user is presented with the list of open reservations at a particular repair facility which can be readily handled in a single telephone call while at the same time having the system on line to implement any needed changes such as extensions of reservations, etc. Additional functionality has also been provided to speed the processing of invoicing which of course also speeds their payment and cash receipts. For example, it was found that even despite the built-in error checking and correction facilities provided to the users of the system, a repetitive pattern of mistakes involving incorrect claim numbers was discovered. To speed the processing of these, an additional functionality was provided as an "electronic audit" known as invoice return which returns an invoice to a particular adjuster upon detection of an incorrect claim number for his human intervention and correction of the claim number. In this manner, problem invoices exhibiting one of the most common problems encountered may be readily handled within the system and in an efficient manner, instead of manually as before.

The parent invention also has as a significant advantage the ability to be further customized to meet the individual business partners' needs and desires as well as to provide additional functionality by offering additional features which become desirable upon accumulation of user data based on user experience. Furthermore, once implemented, they are immediately available system wide. While this allows for consistent usage, it is limited in the sense that all of the system users are forced to use the same menus, data definitions, etc. This is not seen as a limitation for the one-to-one business application intended to be primarily addressed by the parent invention.

Still another advantage of the parent invention is that the graphical user interface incorporates point and click interaction, using buttons and tabs to present or conceal data for the user's attention or inattention as the case may be, and provide a much more robust interaction capability through the creation of menu designs that allow for access to the most commonly needed features from any point in the menu architecture. This is to be contrasted with the

prior system which consisted of a main frame character based interface while the parent invention with its GUI interface allows a user to point and click to navigate and to make selections by pull down selection, thereby reducing errors. As users become more experienced with the system, and their confidence level grows, they are much more likely to become bored and aggravated with the rigid structure of the prior system requiring them to follow along a certain menu architecture in order to complete certain tasks. On the other hand, the parent invention generally increases the interest of the user in using the system. These advantages of the parent invention over the prior interface promote employee productivity by allowing a user more control over his work which is critical in achieving savings in human resources to operate the system which is one of its main goals.

A second aspect of the parent invention extends and expands its capabilities and functionalities. With this feature of the parent invention, a user may not only have access to its business partner, but also one or more competitors of its business partner through the same Internet portal. In this way, at least two needs are satisfied. First, the user can have access to a variety of providers to choose from where business needs or desires require. This allows the user to use a single portal and not have to sign on to a number of different portals, even should they be available. Furthermore, the user isn't troubled to learn how to access and use different portals even should they be available. Presently, not all providers are operating an Internet portal for offering their services, so by allowing business competitors to be accessible through the same portal, independent development of other portals is forestalled. This is a benefit to the operator of the main portal as it creates and maintains a competitive advantage by handling all of the order flow which creates a data base of useful information for marketing purposes. Although initially the portal services might be offered for no additional cost to a competitor, eventually a fee might be charged which would at least partially offset the cost for owning and operating the portal.

The design of the portal is elegant and offers great flexibility for customizing not only the menus for presentation to the user, but also in the design of the data base entries needed or desired by the user and/or the competitive provider. For example,

some users might not know or care about the features of a vehicle rented and so those data entries may not be provided space on the menu for the user to fill in. The data base as handled by the networked computer system then need not keep track of that data for that customer. This feature is readily accommodated by the data base programming and is conveniently implemented.

In still another aspect of the parent invention, the web portal has the capability to accommodate the varying data requirements also of the various competitive providers, but also the level of their sophistication as evidenced in their respective computer systems and interface facilities. For example, the web portal may be configured to communicate the user's order to the competitive provider via email, phone, or even through a connection directly to an integrated computer system having the same or substantially the same interoperability as the integrated computer system of the assignee hereof. This capability extends to accommodating and matching the competing data requirements of the user and the competitive providers, and having the flexibility to design and implement menus that readily meet these competing needs. Furthermore, this implementation allows for changes to be made by simple re-programming of the web portal which minimizes the effort and enhances the "user friendly" aspect.

Not only are these "global" improvements made available with this aspect of the parent invention, there are other more particularized improvements that add functionality within the operating framework. For example, one such improvement is the ability to "virtually" assign work groups within the user so that, for example, multiple adjusters might be made into a team with a shared work load so that all of the team members have access to the same pool of work, such as the placing of reservations for the same group of drivers. With this "virtual team" assignment capability, work groups may be readily re-assigned to match changing work loads without worrying about re-configuring hardware or internal network connections. This can be a very valuable feature to accommodate staffing issues over geographical distances that can be nation-wide, with access through the web portal to reservation facilities which are themselves nation-wide.

Still another feature is the ability to customize an individual user's authorization limits. As can be appreciated, one of the mixed blessings of providing enhanced functionality to the individual users

of any integrated computer system is that it places great power in the hands of the user which at the same time creates the potential for abuse. There have been well publicized instances of "rogue" employees making financial decisions or placing instructions which have far reaching financial consequences well beyond the intended authority of an employee, with disastrous results. With the parent invention, one feature is the ability to limit the financial commitments that a user may make during any pre-selected time period. For example, the user's profile may limit his ability to make only a certain dollar limit of vehicle reservations over any certain number of work days. In this way, added safeguards may be conveniently provided, monitored by reporting capabilities, and changes as circumstances warrant, all with simple programming changes at the web portal.

There are still other features that are provided by the parent invention that find their genesis in the different approach taken and owing to the inherent increased flexibility of using a web based programming for the web portal to interface between the user and the providers on the web server and eliminating the need for any custom software on the user's terminal. The details of these are to be found and described in the detailed description of the preferred embodiment below. Examples include the ability to send confirmatory communications to the user that the reservation has been received and entered into the provider's system for fulfillment, custom report design including the capability to save and re-generate the custom report upon user command, increased flexibility to process and pay invoices, etc.

The present invention extends the paradigm of GUI, web based, internet connectivity to the integrated software program being utilized by an integrated business to "fulfill" the service/goods requested to be provided by the multi-level user. This, in a sense, closes the loop in adapting the many advantages of this paradigm to an integrated business dealing with sophisticated customers who themselves are integrated, each with multi-level organizations that are best able to utilize the many features, improved efficiencies and cost savings of the present invention. Using the parent invention, the communications between user and provider are conducted in GUI, web based, over the internet. Using the present invention, the communications between the employees of the provider and the

transacting of the order flow are handled in the same manner. And, as an added advantage of the present invention, the data flow is enhanced as translation issues between varying software is minimized. Furthermore, with this implementation, the fulfillment software program is resident on an application server which may be centrally located, at company headquarters for example, which provides many advantages over prior art non-web based implementations.

In implementing the present invention there are several advantages realized over the prior art non-web based implementations.

10 A first advantage is that the invention is implemented in software that is mainstream and being used in many different applications by others. Consequently, the work of others in extending the connectivity, for example, of a web based browser to other kinds of "input" devices provide a ready extension for the same feature to be added for users to input data/reservations, etc., in the present invention. This facilitates the continuing improvement and up-
15 grading of the system as technology evolves without the significant dedication of resources that would be required when using proprietary technology.

20 A second advantage is provided by the hardware arrangement which is possible due to the software design. In the prior art system, the software components providing the user interface, the business logic, and the data base storage and access are all contained on a single central processor. For this design, scaling to allow for increased transaction load required that additional central
25 processors be provided and the users segmented in some logical fashion such as geographically, which had operational disadvantages including limiting access to data between geographically segmented users. With the present invention, the software components providing the user interface (GUI), the business logic, and the data may
30 themselves be separated and operated on different hardware allowing them to be individually scaled to accommodate increased transaction load without the limitations of the prior art. In other words, each user accesses the same, scaled data base and hence has access to all
35 data available on the system.

Still other advantages realized parallel those provided by the parent invention including the general familiarity of people with web browsers which greatly reduces the training and improves each user's effective use of the program, the generic nature of the code used to

implement the program, such as HTML, adds to the flexibility of making changes including hiring and training software programmers to maintain and improve the code to implement new features, and the ready scalability of the paradigm is also important in the business environment enjoyed by the assignee where continual growth in transactions may be readily accommodated merely by adding parallel server processors with minimal communication/switching facility between them.

While the principal advantages and features of the invention have been discussed above, a greater understanding of the invention including a fuller description of its other advantages and features may be attained by referring to the drawings and the detailed description of the preferred embodiment which follow.

Brief Description of the Drawings

Figure 1 is a schematic diagram of the computer systems comprising the parent invention;

Figure 2 is a flow chart of the software programs which communicate over the computer systems of fig. 1 to implement the parent invention;

Figure 3 is a schematic diagram of the computer systems comprising the parent invention; and

Figure 4 is a schematic diagram of the computer systems comprising the present invention including its connection into the entire system of the present invention.

Detailed Description of the Preferred Embodiment

The overall system architecture for the parent invention 20 is best shown in Fig. 1. As shown therein, an insurance company computer system 22, which itself may be virtually any computer configuration or even a stand alone PC accesses the Internet 24 through any convenient access point 26 such as even including an ISP (Internet service provider), as known in the art. Also connected to the Internet 24 is a web portal 28 which is preferably provided by a server appropriately programmed as explained herein below. This web portal 28 may be appropriately configured as desired to suit any particular business relationship or arrangement, although preferably the inventors herein and assignee of this invention have determined that a 24/7 or full time connection to the Internet 24 is preferable, except for scheduled downtimes for maintenance, etc. The service provider 30 which for purposes of explaining the parent preferred

embodiment is preferably a vehicle rental organization, has itself an Internet portal mainframe 32 connected by a bi-directional communication link 34 to a second computer network 36 which may itself preferably have a mainframe server 38. This second computer system 36 is preferably a network having a database 40 for communication with what may be thousands of branch offices each of which has its own computer interface 44 which communicates to this second mainframe server 38 to conduct the integrated business functions of a service provider organization. Instead of communicating with the branch offices directly, a reservation may be communicated to a centralized location for further processing including assignment to and access by an appropriate branch office. This might be desirable under certain circumstances, such as if a branch office is closed, or when a purchaser requires some specialized service such as close monitoring of the rental. This may be done electronically and automatically, or with human intervention. The present invention, as explained below, provides for the first time a web-based, GUI internet browser paradigm for the "fulfillment" software program provided on this second mainframe server processor 38.

It should be noted that the particular computer configuration chosen as the preferred embodiment of the parent invention may itself be subject to wide variation. Furthermore, the term "mainframe" as used herein refers solely to a computer which can provide large scale processing of large numbers of transactions in a timely enough manner to suit the particular business application. Preferably, as is presently used by the assignee hereof, an IBM AS/400 mainframe computer is used as each of computers 32, 38. However, as is well known in the art, computer technology is subject to rapid change and it is difficult if not impossible to predict how these computer systems may evolve as technology advances in this art. For example, it is not beyond the realm of possibility that in the not so distant future a network of computers would provide the processing power to conduct these business operations as presently handled by "mainframe" computers. Thus, the term "mainframe" is not used in a limiting sense but merely to indicate that it is descriptive of a computer suited to handle the processing needs for a large scale business application. A further example is noted below as the implementation of the present invention.

It should also be noted that the communication link 46 extending between the server 42 and each of the branch offices 44 may have alternative configurations. For example, in some applications access over the Internet may itself be adequate, recognizing the vagaries of Internet service availability, reliability, and processing speed. Alternatively, this communication link 46 could well be a dedicated pipeline providing broadband service connection full time with back up connections to ensure continuous communication between a particular branch office or groups of branch offices and the service providers business operations computer system 36. Some branch offices might even be served through satellite links. Indeed, it is even possible that a mixture of these wide variations of service level be present within a single organization's structure depending upon communication link cost and availability balanced against service needs. It should merely be noted for present purposes that this communication link 46 serves as the electronic umbilical cord through which branch offices 44 communicate with the business computer system 36 of the present invention.

Attached as exhibits to the parents noted above are functional descriptions of the software programs resident on the computers comprising the two computer systems 32, 38 which implement the parent invention. More particularly, attached thereto as Exhibit A is a functional description of the software to implement the integrated business functions resident on the AS/400 or mainframe computer 38. As explained below, the present invention provides a different software program for this computer 38 which implements the GUI web-based, browser inter-connectivity with the branch offices. The functional description for purposes of implementing the present invention is attached hereto as Exhibit F. Exhibit F includes several related documents including an overall design architecture document, a "speciality vehicle system" program, a plurality of use case and screen action specifications, and other related documents which detail the software needed to implement invention. Attached to the parents as Exhibits B and C are related flow diagrams and explanatory text, respectively, for the software resident on the mainframe AS/400 computer 32. It is believed that these functional descriptions and accompanying text as exemplified in these exhibits are adequate to enable an ordinary programmer to implement corresponding software programs for executing the preferred

embodiment of the parent and present invention using ordinary programming skills and without inventive effort.

As a further example of the flow of data and the functional advantages provided by the parent invention, reference is made to Fig. 2. As shown therein, a right hand column is identified as "ECARS" which represents the integrated business software implemented as part of the mainframe operation 38 in computer network 36. The center column headed "ARMS" is resident on mainframe computer 32 and coordinates the communication of data. The left column headed "ARMS/WEB" represents the software resident on computer but which is presented on server 28 and accessible by users through the Internet. Along the left side of Fig. 2 are designated three separate sections of operational activity. These are "reservation" followed by "open" and concluded by "close". Generally, the functional descriptions are arranged in chronological order proceeding from the top of Fig. 2 to the bottom. However, some functional features are permitted throughout the entirety of one of the three periods designated at the left side of Fig. 2. One such example is the "message" function which allows messages to be sent between users at one business organization 22 and branch offices 44 and others connected to the other business organization 30. Proceeding with a description of the transaction, the first set of communications allow for the reservation of the services. These can include requests for authorization or a rescind authorization request to be sent from the service provider to the service purchaser. Correspondingly, authorizations and authorization cancels can be sent from the services purchaser to the services provider. Confirmations are communicated upon confirmation of an authorized reservation request. Authorization changes may be made and communicated from the services purchaser to the service provider. Corresponding rental transaction changes may be communicated from the services provider to the services purchaser. As indicated, through the entirety of this process messages may be sent between users and others connected or having access to the integrated business software, as desired. The consummation of this portion of the transaction is a reservation that has been placed, authorized, confirmed, and provision is made for changes as necessary. During the next phase of the transaction, a reservation is opened and services intended to be provided are started. Generally, and preferably for the rental of vehicles, a

start and end date are established in the reservation process. However, along the way, transactional changes may be made, such as for changing the type of vehicle provided, extensions may be requested and entered from either business partner, messages may be transmitted between the business partners, and the transaction may be terminated such as by voiding the contract by one business partner or terminating the authority by the other business partner. The term "reservation" has been used herein to refer not only to the act of placing the order but also to filling the order for services including providing the rental vehicle to the ultimate user and even invoicing for those services.

The last phase of the process involves closing the transaction. During this phase of the transaction, the contract is indicated as being closed and invoiced, the services purchaser can approve invoices, reject invoices, and also remit invoices. Such invoice remittance may also include the actual transfer of funds through an electronic funds transfer medium, or otherwise as previously arranged between the business partners.

It should be understood that this is a streamlined description of the handling of a transaction, and by no means is exhaustive. For example, much more functionality is available to the user including accessing the data base to generate production reports regarding status of open or closed reservations, preparing action item lists to allow a user to organize and prioritize his work, obtaining information available in the system from having been entered by others which would otherwise require phone conversations which are inefficient and occupy still another person's time. A more detailed explanation of the functionality provided is found in the exhibits.

In summary, the parent invention creates almost an illusion that the services purchaser, and the great number of users at various levels of the multi-tier purchaser users, are actually part of the services provider organization in that immediate online access is provided to significant data which enable the user to make reservations for services, monitor those services as they are being provided, communicate with those providing the services, obtain information relating to the status of services as they are being provided, and close transactions, all by interacting with the services provider business organization over that user's PC and without human interaction required by the business providers

personnel. By way of contra-distinction, for many years business has been conducted on a human level by customers picking up the telephone and calling services providers and talking to their human counterparts in order to convey information, place orders, monitor
5 orders, including obtaining information as to status, canceling orders, questioning invoices and paying invoices, along with a myriad of other related interactions. Not only did the conduct of business in this manner entail significant amounts of human resources at both ends of the transaction, but it also led to inefficiencies, mistakes
10 and delays all of which increase the cost of doing business and contribute to an increased risk of services being rendered in an unsatisfactory manner in many instances to the end user. The parent invention has taken the preexisting solution of providing electronic communication between the business partners to another level by "web
15 enabling" this system for improved connectivity, improved usability, reduced training, enhanced mobility, and other advantages as described herein.

A schematic diagram of still another parent invention is shown in Fig. 3 and includes three levels of architecture. As shown in the
20 first level of the architecture 50, a user 52 such as an insurance company or other user has access through the Internet 54 to the computer system comprising and incorporating this parent invention. An Internet provider provides a link 56 through which Internet
25 connections may be made to communicate with the further described system. For convenience, this Internet connection may be considered as an Internet site or portal in that a user enters a URL and arrives at this connection. A firewall 58 as is known in the art is used for security purposes and to prevent hackers and the like from
30 unauthorized access to the system. A first set of servers 60 are interconnected in a network 62 and may preferably include an ancillary server 64 for running load balancing software or the like to balance the load and provide redundancy amongst what may be a plurality of web servers 60. These web servers 60 may preferably be
35 such suitable software as would be well known to those of ordinary skill in the art. This first web server network of servers 60, 62 process the random and disorderly communications flowing to and from this system and the Internet before passing them through a firewall 66 as a further precautionary measure. This first layer of

architecture, identified as the Internet space/DMZ layer provides a secure interface and creates order out of the chaos of communications flowing between the system and others, as will be described.

5 The next layer of architecture 68 is noted in the figure as the "Enterprise private network" and is comprised of a plurality of servers 70 network connected with a network connection 72. Again, although the choice of hardware is not considered critical by the inventors hereof, Sun Microsystem's server/work station hardware is preferably used to provide the platform for running the application software for processing the various rental vehicle transactions, as will now be explained. Attached to one of the parent filings noted above as Exhibit E are a series of functional design specifications for the ARMS/WEB application software resident on servers 70 and which provide the detailed description of the operational features of the software and system. With these functional design specifications for the individual modules, it would be readily apparent to those of ordinary skill in the art that programmers of ordinary skill would be able to write software to execute these functional specifications without using inventive effort. Furthermore, the details of this implementation are not considered to provide any aspect of the best mode for carrying out the invention which is defined by the claims submitted either in a parent filing or herein.

Generally, the ARMS/WEB application software permits a user to sign on and, when recognized, provides the series of menus presenting choices for the user to indicate the parameters for his reservation. A plethora of information is provided and accessible to the user through the various menus provided from which the user selects and enters data to process the reservation. An important feature of the ARMS/WEB application software is that it provides the user the opportunity to select to place his vehicle rental reservation not only with the integrated business computer system represented by the third level of architecture 74, described below, but also to route the reservation information back through the first architectural level 50 and into the Internet 54 for transmission to a competitive service provider 76. Although the interconnection is depicted in Fig. 3 as being made through the Internet 54, the network of servers 70 configured in accordance with the ARMS/WEB application software may utilize virtually any electronic means for transmitting the reservation information to a competitive services provider 76. These

include email, automated telephone, facsimile, and other forms of electronic communication. Of course, the competitive services provider 76 may itself comprise an integrated business such that the level of interconnectivity provided to the user 52 may parallel that disclosed and described in connection with the integrated services provider system of the present invention as well as the parent invention. This integrated business capability is represented as the third level 74 of the architectural topography shown in Fig. 3 which parallels portions of that shown in Fig. 1 in that a pair of network mainframe computers, such as AS/400's 78, 80 may process reservations to and from various branch offices 82 which are geographically diverse. It is in this environment that the present invention has implemented a GUI web-based, internet browser software program to effectively complete the loop on adapting the entire integrated business operation into the internet.

With the parent invention, the Internet portal provided by the ARMS/WEB network configured servers 70 provide an Internet portal for communication with not only the integrated computer enabled business system of the resident services provider, but also a portal for placing reservations to other competitive services provider 76. Thus, the user 52 enjoys the capability of accessing multiple service providers for competitive services through a single Internet connection using a single set of protocols, menus, etc. for the conduct of this business activity.

With the present invention, this Internet connectivity has been extended to allow the integrated business employees to enjoy the same advantages as provided by the parent to the user's employees. Furthermore, the software configured network of servers 70, as well as that comprising the integrated computer enabled business system of the resident services provider utilizing the present invention, is readily configured in Web Logic, or other suitable middleware, to adapt to changing user requirements, data requirements, unique competitive service provider requirements, and other upgrades or modifications in a convenient manner by simply modifying the software resident therein. Standard browser software with no special modifications may be used by the user, or by any branch employee, and any special interconnecting software or server/hardware requirements may be satisfied as between the third party service providers such that both the user and the branch employee is presented with a

seamless interconnection. As the present invention is configured and works well with the integrated business and computer systems as disclosed herein, it is anticipated that such interconnection and usability may be readily translated to any other such integrated computer system as might be found in other competitive service providers, as would be apparent to those of ordinary skill in the art. Thus, with the present invention, not only is a user provided with Internet access through a single portal to a plurality of service providers and, to the extent possible, to their integrated computer business systems, a branch employee is also provided this same methodology for interacting with the system to handle transactions.

A more detailed schematic layout of the integrated business computer network as implemented to provide the GUI web-based internet browser system of the present invention is shown in Figure 4. As shown therein, an applications server 100 represents the second main frame shown in the earlier figures, and on it resides the main system software program which implements the invention. It is connected through a web server 102 and a load balancer 104 to a WAN for interconnection to a plurality of branch offices 106 and a "failover" configured server farm 108 or other computer network to accommodate excess traffic over the WAN demanding access to the applications server 100. Each branch office may have a "thin client" device 110 which is sufficient to access server 100 via a LAN or WAN that includes at least a web browser. The thin client 110 is typically also connected into a local network, with a number of other thin clients, to provide connectivity to a number of branch employees. The applications server 100 is also connected to a data base storage server 112, or the like, which may be operating an Oracle data base for storage of data corresponding to the transaction data describing the multitude of transactions handled through the system. The applications server 100 is directly connected to another main frame 114 which provides the management function and connectivity to the user, as explained in greater detail above.

Various changes and modifications to the preferred embodiment as explained herein would be envisioned by those of skill in the art. Examples of these changes and modifications include the utilization of computer systems configured in any one of a myriad of ways using present technology alone. For example, mobile computers are

presently available and wireless technology could be used to extend the integrated business network of the services provider, as well as match the mobility needed by the various users and branch employees connected to and using the present invention. The particular
5 software, and various aspects and features of its design, have been adapted for particular application to the vehicle rental business. Of course, computer software applications satisfying other business needs would necessarily require adaptation to their particular business models. Thus, it is envisioned by the inventors herein that
10 the various software programs described herein would be matched to the particular business application to which the invention is utilized. These and other aspects of the preferred embodiment should not be viewed as limiting and instead be considered merely as illustrative of an example of the practical implementation of the
15 present invention. These changes and modifications should be considered as part of the invention and the invention should be considered as limited only by the scope of the claims appended hereto and their legal equivalents.

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